

23
Paper Number

REQUEST FOR ACCESS

DATE: May 24, 94
SERIAL NUMBER: 422699
FILING DATE: Oct. 17, 89
APPLICANTS: Herman Oppermann

SIR:

THE UNDERSIGNED HEREBY RESPECTFULLY REQUESTS ACCESS TO THE FILE HISTORY OF THE FOLLOWING ABANDONED APPLICATION WHICH WAS REFERRED TO IN U.S. PATENT NUMBER 5266683 OR PRINTED APPLICATION _____.

RESPECTFULLY SUBMITTED,

V. Click

OFFICIAL USE ONLY

MM

Initials
File Information Unit

United States Patent [19]
Oppermann et al.

US005266683A

[11] Patent Number: **5,266,683**

[45] Date of Patent: * Nov. 30, 1993

[54] **OSTEOGENIC PROTEINS**

[75] Inventors: **Hermann Oppermann, Medway;**
Engin Ozksaynak, Milford; Thangavel
Kuberasingh, Medway; David C.
Raege, Hopkinton; Roy H. L. Pang,
Medway, all of Mass.

[73] Assignee: **Stryker Corporation, Kalamazoo,**
Mich.

[*] Notice: The portion of the term of this patent
subsequent to Nov. 2, 2010 has been
disclaimed.

[21] Appl. No.: **841,646**

[22] Filed: **Feb. 21, 1992**

Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 827,052, Jan. 28, 1992, Pat. No. 5,250,302, Ser. No. 579,865, Oct. 7, 1990, Pat. No. 5,108,753, Ser. No. 621,849, Dec. 4, 1990, abandoned, Ser. No. 621,988, Dec. 4, 1990, abandoned, Ser. No. 810,560, Dec. 20, 1991, abandoned, Ser. No. 569,920, Aug. 20, 1990, abandoned, Ser. No. 600,024, Oct. 18, 1990, abandoned, Ser. No. 599,543, Oct. 18, 1990, abandoned, Ser. No. 616,374, Nov. 21, 1990, Pat. No. 5,162,114, and Ser. No. 483,913, Feb. 22, 1990, Pat. No. 5,171,574, said Ser. No. 827,052, is a division of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590, said Ser. No. 579,865, is a division of Ser. No. 179,406, Apr. 8, 1988, said Ser. No. 621,849, is a division of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Aug. 15, 1988, said Ser. No. 621,988, is a division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Feb. 23, 1989, said Ser. No. 810,560, is a continuation of Ser. No. 660,162, Feb. 22, 1991, abandoned, which is a continuation of Ser. No. 422,699, Oct. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 1989, said Ser. No. 569,920, is a continuation-in-part of Ser. No. 422,699, Oct. 17, 1989, and Ser. No. 483,913, Oct. 17, 1989, which is a continuation-in-part of Ser. No. 422,613, Oct. 17, 1989, Pat. No. 4,975,526, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 1989, said Ser. No. 600,024, is a continuation-in-part of Ser. No. 569,920, Oct. 17, 1989, said Ser. No. 599,543, is a continuation-in-part of Ser. No. 569,920, Oct. 17, 1989.

[51] Int. Cl.³ **A61K 37/02; C07K 5/00;**
C07K 7/00; C07K 15/00

[52] U.S. Cl. **530/326; 530/327;**
530/328; 530/350; 530/395; 530/840

[58] Field of Search **530/326, 327, 328, 395,**
530/840, 300, 350

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,172,128 10/1979 Thiele et al. 424/95
4,294,753 10/1981 Urist 530/356
4,394,370 7/1983 Jefferies 424/15
4,434,094 2/1984 Seyedin et al. 530/356
4,455,256 6/1984 Urist 530/356
4,563,350 1/1986 Nathan et al. 424/95
4,563,489 1/1986 Urist 524/21
(List continued on next page.)

FOREIGN PATENT DOCUMENTS

069260 6/1982 European Pat. Off. .
(List continued on next page.)

OTHER PUBLICATIONS

Canalis et al., Science 210:1021-1023 (1980).
Glowacki et al., Lancet 1:959-963 (1981).
Reddi, Collagen Rel. Res. 1:209-226 (1981).
Sampath et al. Proc. Natl. Acad. Sci. USA
78:7599-7603 (1981).

(List continued on next page.)

Primary Examiner—Nathan M. Nutter

Attorney, Agent, or Firm—Testa, Hurwitz & Thibault

[57] **ABSTRACT**

Disclosed are (1) osteogenic devices comprising a matrix containing substantially pure natural-sourced mammalian osteogenic protein; (2) DNA and amino acid sequences for novel polypeptide chains useful as subunits of dimeric osteogenic proteins; (3) vectors carrying sequences encoding these novel polypeptide chains and host cells transfected with these vectors; (4) methods of producing these polypeptide chains using recombinant DNA technology; (5) antibodies specific for these novel polypeptide chains; (6) osteogenic devices comprising these recombinantly produced proteins in association with an appropriate carrier matrix; and (7) methods of using the osteogenic devices to mimic the natural course of endochondral bone formation in mammals.

58 Claims, 47 Drawing Sheets